

CLAIMS:

1. A transformed host cell containing
 - i) a chromosomal gene which inhibits cell growth; and
 - 5 ii) a plasmid encoding an antisense sequence,
wherein the antisense sequence encoded by the plasmid inhibits the action of the chromosomal gene, thereby permitting cell growth.
- 10 2. A transformed host cell according to claim 1 wherein the plasmid comprises a cloning site for insertion of a gene of interest.
- 15 3. A transformed host cell according to claim 1 or claim 2, wherein the plasmid further comprises a gene of interest.
- 20 4. A transformed host cell of any one of claims 1-3, wherein the antisense sequence encoded by the plasmid inhibits the action of the chromosomal gene by binding to the chromosomal gene.
- 25 5. A transformed host cell of claim any one of claims 1-3, wherein the antisense sequence encoded by the plasmid inhibits the action of the chromosomal gene by binding to mRNA transcribed from the chromosomal gene.
6. A transformed host cell of any one of claims 1-5, wherein a regulatory sequence is operably linked to the chromosomal gene.
- 25 7. A transformed host cell of claim 6, wherein the antisense sequence encoded by the plasmid inhibits the action of the chromosomal gene by binding to the regulatory sequence.
- 30 8. A transformed host cell of claim 6, wherein the antisense sequence encoded by the plasmid inhibits the action of the chromosomal gene by binding to mRNA transcribed from the regulatory sequence.

9. A transformed host cell of claim 8, wherein the antisense sequence encoded by the plasmid is encoded by the origin replication of the plasmid.
10. A transformed host cell according to claim 9, wherein the antisense sequence encoded by the plasmid is RNAI or a portion thereof and the regulatory sequence operatively linked to the chromosomal gene encodes RNAII or a portion thereof.
11. A transformed host cell according to claim 10, wherein the antisense sequence encoded by the plasmid is RNAII or a portion thereof and the regulatory sequence operatively linked to the chromosomal gene encodes RNAI or a portion thereof.
12. A host cell comprising a chromosomal gene which inhibits cell growth operatively linked to a regulatory sequence located upstream of the chromosomal gene, wherein the regulatory sequence is an RNAI gene or a portion thereof, or an RNAII gene or a portion thereof.
13. A transformed host cell according to any one of claims 1-11 or a host cell according to claim 12, wherein the cell is in culture *in vitro*.
14. A transformed host cell according to any one of claims 1-11 or a host cell according to claim 12 and 13 which is a prokaryotic cell.
15. A transformed host cell or a host cell according to claim 14 which is a bacterial cell.
16. A transformed host cell or a host cell according to claim 15, wherein the cell is a gram negative bacterial cell.
17. A transformed host cell or a host cell according to claim 16, wherein the cell is an *E. coli* cell or a *Salmonella* cell.
18. A transformed host cell or a host cell according to claim 15, wherein the cell is a gram positive bacterial cell.

19. A transformed host cell or a host cell according to claim 18, wherein cell is a *Bacillus* cell.
20. A transformed host cell or a host cell according to any one of claims 15-19 which is an attenuated cell.
21. A transformed host cell or host cell according to any one of claims 1-13 wherein the cell is a eukaryotic cell.
- 10 22. A transformed host cell according to claim 21 wherein the cell is a fungi, such as yeast.
23. A transformed host cell according to claim 21, wherein the cell is a plant cell.
- 15 24. A transformed host cell according to claim 21 wherein the cell is an animal cell such as a mammalian cell or an insect cell.
25. A transformed host cell or a host cell according to any one of claims 1-24, wherein the chromosomal gene is a toxin gene.
- 20 26. A transformed host cell or a host cell according to claim 25, wherein the toxin gene is *sacB*.
27. A transformed host cell or a host cell according to any one of claims 1-24, wherein the chromosomal gene encodes a repressor protein that inhibits expression of a second chromosomal gene essential for cell growth.
- 25 28. A transformed host cell or a host cell according to claim 27, wherein the second chromosomal gene is conditionally essential for cell growth.
- 30 29. A transformed host cell or a host cell of claim 27 or claim 28 wherein the chromosomal gene encodes the repressor *lacI* and the second chromosomal gene is operatively linked to a *lac* operator and promoter.

30. A transformed host cell or host cell according to claim 27 or claim 28 wherein the chromosomal gene is *dapD* or *fabA*.
31. A transformed host cell or host cell according to any one of claims 1-24, wherein the 5 chromosomal gene encodes an antisense sequence that inhibits expression of a second chromosomal gene essential for cell growth.
32. A transformed host cell or host cell according to claim 31, wherein the antisense sequence encoded by the chromosomal gene inhibits expression of the second 10 chromosomal gene by binding to the chromosomal gene.
33. A transformed host cell or host cell according to claim 31, wherein the antisense sequence encoded by the chromosomal gene inhibits expression of the second chromosomal gene by binding to mRNA transcribed from the second chromosomal 15 gene.
34. A transformed host cell or host cell according to any one of claims 31-33 wherein the second chromosomal gene is conditionally essential for cell growth.
- 20 35. A transformed host cell or host cell according to any one of claims claim 31-33, wherein the second chromosomal gene is *dapD* or *fabA*.
36. A transformed host cell or host cell according to any one of claims 1-35 wherein the chromosomal gene or the regulatory sequence-chromosomal gene fusion is under the 25 control of a constitutive promoter.
37. A transformed host cell or host cell according to any one of claims 1-35 wherein the chromosomal gene, or the regulatory sequence-chromosomal gene fusion is under the control of an inducible promoter.
- 30 38. A method of maintaining a plasmid in a host cell *in vitro* comprising the step of culturing a transformed host cell of any one of claims of claims 1-11 or 13-37 under conditions sufficient to permit said cell to grow.

39. A method of producing plasmid DNA comprising culturing a transformed host cell according to the method of claim 40 and isolating the plasmid DNA

5 40. A method of producing a recombinant protein comprising culturing a transformed host cell comprising a plasmid encoding a protein of interest according to the method of claim 40 and isolating the protein from the cell.

10 41. A pharmaceutical composition comprising a transformed host cell or a host cell according to any one of claims 1 to 37 together with a pharmaceutically acceptable excipient, diluent or buffer.

42. A transformed host cell or a host cell according to any one of claims 1-37 for use in therapy.

15 43. Use of a transformed host cell or a host cell according to any one of claims 1-37 in the manufacture of a medicament for gene delivery or protein delivery.

20 44. A method of delivering a gene of interest to a patient comprising administering to the patient a transformed host cell according to any one of claims 3 to 11 or 13 to 37.

25 45. A method of maintaining a plasmid in a recipient organism comprising introducing a transformed host cell according to any one of claims 1 to 11 or 13 to 37 into said organism, wherein said chromosomal gene is said transformed host cell is essential for cell growth in vivo.